COVER SHEET

Influence of distribution of lean body mass on resting metabolic rate after weight loss and weight regain: comparison of responses in white and black women[1,2,3,4]

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ABSTRACT

Background: Little is known about the effect of weight change on regional lean body mass (LBM) distribution or on racial differences in resting metabolic rate (RMR).

Objective: The study compared total and regional LBM patterns in white and black women after weight loss and regain and assessed the influence of regional LBM on variances in RMR.

Design: Eighteen white and 22 black women who did not differ in age, weight, and height were studied 3 times: in the overweight state, after weight reduction to the normal-weight state, and after 1 y without intervention. Total and regional lean and fat masses were assessed by dual-energy X-ray absorptiometry.

Results: White and black women did not differ significantly in mean (± SD) weight loss (13.4 ± 3.6 and 12.7 ± 3.2 kg, respectively) and regain (6.1 ± 5.5 and 6.4 ± 5.4 kg, respectively). Black subjects had significantly less trunk LBM and significantly more limb LBM at each time point ($P < 0.05$). In both races, weight regain was associated with significant increases in limb LBM ($P < 0.05$) but not in trunk LBM ($P = 0.21$). RMR, adjusted for total LBM and fat mass, was significantly higher in white women after weight loss ($P < 0.01$) and regain ($P < 0.01$). However, no racial difference was found when RMR was adjusted for LBM distribution.

Conclusions: In both races, trunk LBM decreased with weight loss and remained lower, despite significant weight regain, which potentially reflected decreased organ mass. Regional LBM distribution explained the racial difference in RMR.

Key Words: Overweight • obesity • weight loss • body composition • resting metabolic rate • lean body mass • fat mass • regional distribution • African American women

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